

Cleft Rhinoplasty: A Single Institution’s Experience of 1170 Rhinoplasties Among 1007 Patients with Cleft Lip Nasal Deformity

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BACKGROUND & OBJECTIVES

Despite significant progress in cleft care in the past several decades, cleft lip nasal deformity continues to be challenging aesthetically and functionally. The purpose of this study is to examine the nasal outcomes of cleft rhinoplasties at a single institution.

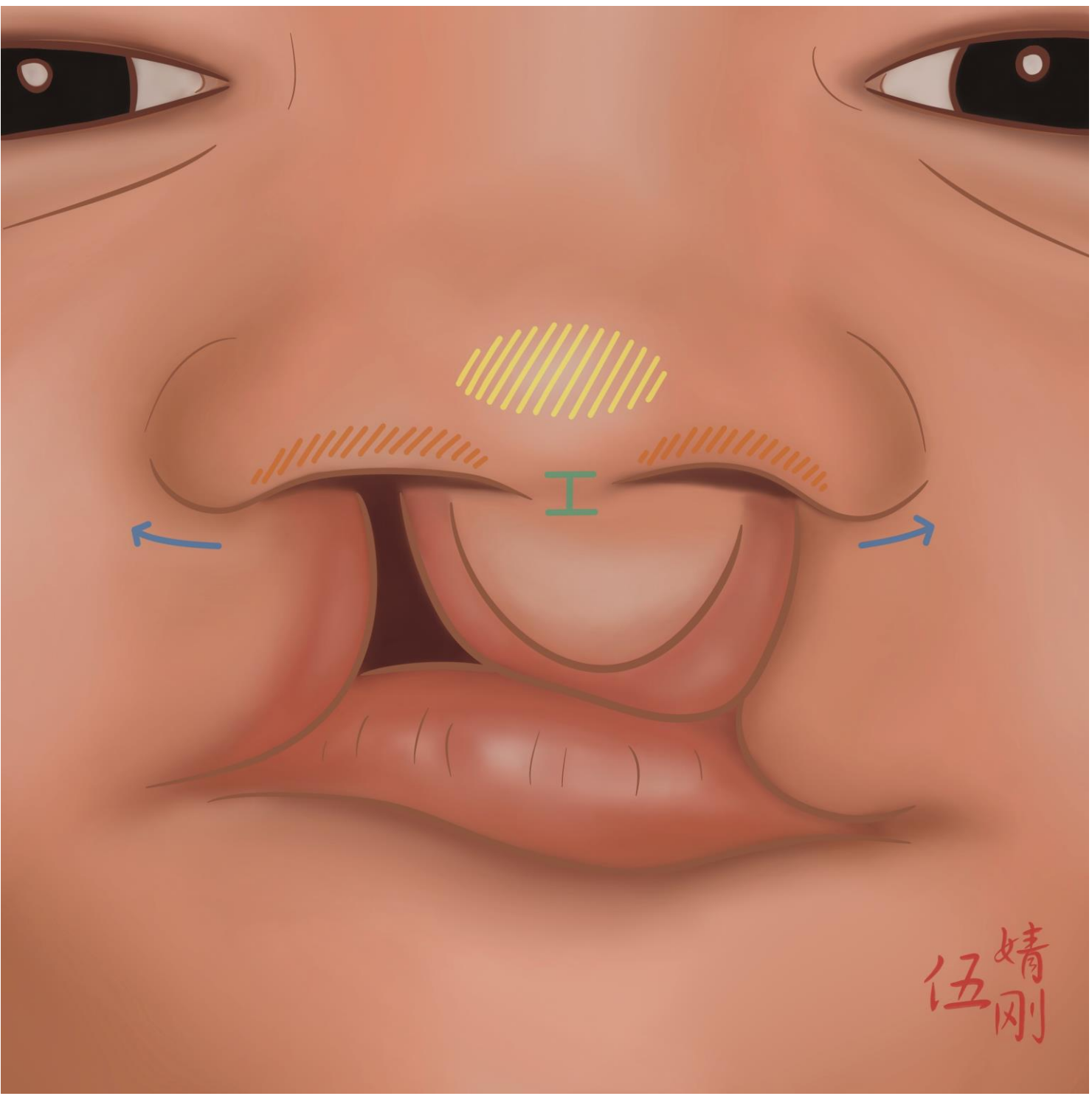
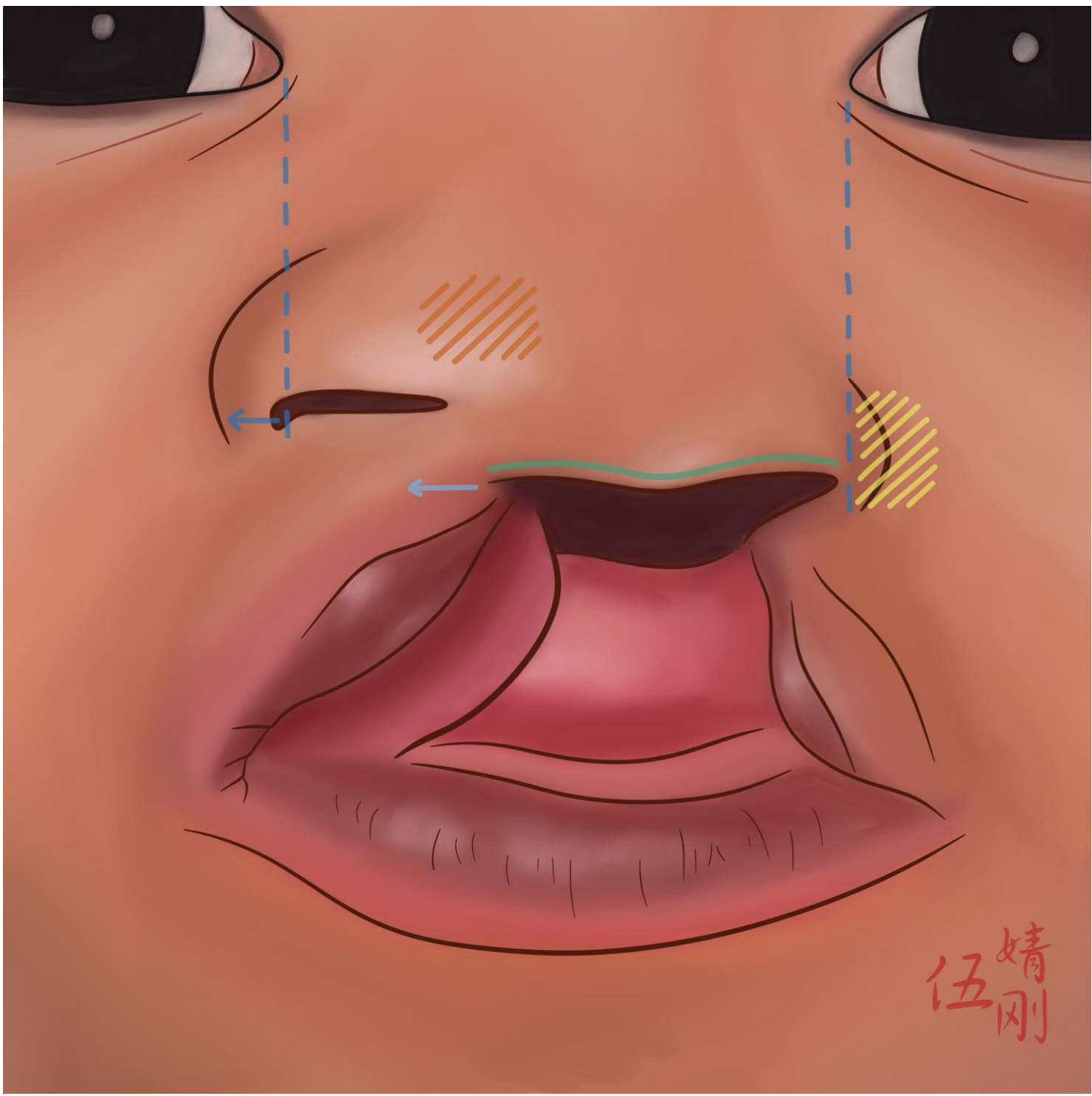


Figure 1. (Left) Unilateral cleft lip nasal deformity with cleft-side slumping of the nasal dome (green), lateral displacement of the non-cleft alar base (dark blue), non-cleft deviation of the columella and philtrum (light blue), posterior displacement of the cleft-side alar base, blunting of the cleft-side alar-cheek junction (yellow), and a “boxy” non-cleft nasal dome (orange).

Figure 2. (Right) Bilateral cleft lip nasal deformity with broadening of the nasal tip (yellow), shortening of the columella (green), lateral (and possibly inferior and/or posterior) displacement of the alar bases (blue), and flattening of the nasal alae (orange).

METHODS

We performed a retrospective cohort study of patients with cleft lip and/or palate who underwent rhinoplasty at our institution from 2006 to 2023. Demographic information, cleft classification, comorbidities, surgical history, operative records, and 90-day complications were collected from medical records. Cleft rhinoplasties were classified into three groups: primary, occurring at the time of definitive lip repair; intermediate, occurring between definitive lip repair and age 12; and definitive, occurring at age 12 or older. In total, 1170 cleft rhinoplasties among 1007 unique patients were included.

RESULTS SUMMARY

Four-hundred and ninety-seven (42%) were primary, 364 (31%) were intermediate, and 309 (26%) were definitive cleft rhinoplasties. Mean ages at surgery were 0.45 ± 0.29 years, 7.8 ± 1.7 years, and 17.3 ± 4.2 years, respectively. In the intermediate rhinoplasty group, the distribution of cartilage graft use was as follows: iliac crest, 41%; no cartilage, 37%, ear, 11%; nasal, 6%; and alloplastic implant, 5%.

In the definitive rhinoplasty group, distribution of cartilage graft use was the following: nasal, 47%; no cartilage, 21%; rib, 10%; ear, 12%; alloplastic implant, 5%; iliac crest, 4%; and cadaver, 0.4%. Our subset of patients with complete follow up to skeletal maturity had a mean of 2 (range 1-8) lifetime rhinoplasties. Among cleft rhinoplasties with no concurrent procedures, number of prior rhinoplasties did not correlate with operative time ($p>0.05$). Rhinoplasties utilizing rib grafts were more likely to have postoperative complications (28% versus 2%, $p<0.001$), while rhinoplasties without cartilage graft use were less likely to have postoperative complications (1% versus 5%, $p=0.009$). Mean follow-up period was 8.4 ± 6.0 years.

PRIMARY RHINOPLASTY

Long-Term Surgical Outcomes

Among patients who underwent definitive cleft lip repair at our institution with a current age of 18 or older ($n=199$), 94 (47.2%) underwent primary rhinoplasty. Follow-up was 15.0 ± 4.8 years in the PR cohort and 15.0 ± 5.1 years in the NPR cohort ($p=0.993$). In bilateral cleft lip, interdomal suture predicted fewer subsequent rhinoplasties ($\beta=-0.310$, $p=0.033$), while history of primary rhinoplasty predicted greater age at subsequent rhinoplasty ($\beta=1.800$, $p=0.040$). Among individuals with follow-up beyond age 18, intranasal stenting predicted fewer subsequent rhinoplasties ($\beta=-0.609$, $p=0.015$). Most underwent subsequent nasal correction aside from 7 (19.4%) and 9 (20.9%) in the PR and NPR cohorts, respectively ($p=0.536$). There was no difference in mean subsequent rhinoplasties between cohorts (1.1 ± 0.8 versus 1.3 ± 1.1 , $p=0.284$). Individuals with complete cleft lip underwent more lifetime rhinoplasties (1.9 ± 1.0 versus 1.2 ± 1.2 , $p=0.007$).

PRIMARY RHINOPLASTY

Aesthetic Outcomes

History of primary rhinoplasty predicted decreased columellar deviation angle independent of cleft lip severity index, age at surgery, history of nasoalveolar molding, and nasal stenting duration ($\beta=-2.375$, $p=.019$). Moreover, primary rhinoplasty predicted improved nostril area symmetry independent of cleft lip severity index, age at surgery, history of nasoalveolar molding, nasal stenting duration, lip repair technique, and surgeon ($\beta=0.111$, $p=.038$). Older age at surgery predicted a greater Goode’s ratio independent of history of primary rhinoplasty, cleft lip severity index, history of nasoalveolar molding, nasal stenting duration, lip repair technique, and surgeon ($\beta=0.224$, $p=.035$).

INTERMEDIATE RHINOPLASTY

Use of iliac crest graft predicted fewer subsequent rhinoplasties ($\beta=-0.167$, $p=0.036$) independent of age at surgery, age at most recent follow-up, sex, race, syndromic status, and surgeon. Moreover, employment of a V-Y chondromucosal flap in the unilateral cleft lip group ($\beta=-0.365$, $p=0.004$) and placement of a columellar strut graft in the bilateral cleft lip group ($\beta=-0.404$, $p=0.050$) predicted fewer subsequent rhinoplasties. The proportion of rhinoplasties utilizing iliac crest grafts increased over time ($\beta=17.852$, $p<0.001$). Most (55.0%) patients with follow-up beyond age 18 ($n=60$) did not require subsequent rhinoplasty.

CONCLUSION

Primary rhinoplasty improves nasolabial aesthetic outcomes at 5 years postoperatively but does not reduce lifetime surgical burden. Intermediate rhinoplasty can be the final nasal intervention for a significant portion of patients.

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